

2D slope surface profilers based on a Shack Hartmann Sensor for sub 100 nrad slope error measurement

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Focusing high brightness x-ray light available with third/fourth generation synchrotron/FEL sources requires significant advances in the quality of X-ray mirrors and in the metrology used to optimize their fabrication. The operational solution from NSLSII and Imagine Optic (a French optics technologies company) was to develop a way to perform automated high accuracy optical measurements for the testing of advanced x-ray mirrors. The adopted solution is a piece of equipment based mainly on a Stitching Shack Hartmann Optical Head (SSH-OH). This approach is innovative and provides a stand-alone, non-contact, large-surface high accuracy optical metrology system for 2D slope measurements. We will describe the measurement setup and discuss the results obtained with the developed system.

- [1] “A 2 D high accuracy slope measuring system based on a Stitching Shack Hartmann Optical Head”
Mourad Idir, Konstantine Kaznatcheev, Guillaume Dovillaire, Jerome Legrand, and Rakchanok Rungsaawang,
Optics Express, Vol. 22, Issue 3, pp. 2770-2781 (2014) <http://dx.doi.org/10.1364/OE.22.002770>
- [2] “A 2D optical slope measuring tool for x-ray mirrors“, Mourad Idir and Guillaume Dovillaire,
30 October 2013, SPIE Newsroom. DOI: 10.1117/2.1201310.005171
- [3] <http://www.imagine-optic.com/> A provider of Shack-Hartmann wavefront sensing hardware and software.